Supreme Court, U.S.
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No. 01-

IN THE

Supreme Court of the United States

TEGAL CORPORATION,

Petitioner,

v.

TOKYO ELECTRON AMERICA, INC.,

Respondent.

ON PETITION FOR A WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

PETITION FOR A WRIT OF CERTIORARI

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QUESTIONS PRESENTED

1. When all federal and state courts follow a standard of review in cases involving "mixed questions" of law and fact under which ultimate questions of law are reviewed *de novo* and subsidiary questions of historical fact are reviewed for clear error, and when Rule 52(a) of the Federal Rules of Civil Procedure compels appellate deference to factual findings by the District Court, is the Federal Circuit justified in reviewing all aspects of patent claim construction *de novo*, even on matters that involve subsidiary questions of historical fact, such as the meaning of technical terms of art that cannot be interpreted correctly without evaluating expert testimony and other evidence bearing on how a person skilled in the relevant art would construe the term?

2. Where the District Court has not addressed an issue of claim construction but has entered detailed findings of fact pertinent to the issue, is it an abuse of discretion for the Federal Circuit to decide the claim construction issue in the first instance on appeal without considering, taking into account or finding clear error in the District Court's findings; to adopt *sua sponte* a claim construction that has not been argued by any party or suggested by the District Court's findings; and then, on rehearing, to refuse to consider record evidence showing the *sua sponte* construction to be erroneous, thereby depriving any party who objects to the *sua sponte* construction of notice and an opportunity to be heard?

PARTIES TO THE PROCEEDING AND STATEMENT PURSUANT TO RULE 29.6

The caption to the case identifies all of the parties to the proceeding below.

Petitioner Tegal Corporation has no parent corporation, and no publicly held company owns 10% or more of Tegal Corporation's stock.

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Tegal Corporation hereby petitions for a writ of certiorari to review the decision of the United States Court of Appeals for the Federal Circuit in this case.

OPINIONS BELOW

The Federal Circuit's decision affirming-in-part, reversing-in-part, and remanding to the District Court for further proceedings (Appendix to Petition ("App.") 1a-42a) is reported at 257 F.3d 1331. The District Court opinion and judgment reviewed by the Federal Circuit (App. 45a-75a) are unreported.

STATEMENT OF JURISDICTION

The Federal Circuit entered its opinion and judgment on July 16, 2001. (App. 1a-44a.) The Federal Circuit denied Tegal Corporation's petition for rehearing on September 4, 2001. (App. 76a-77a.) On November 27, 2001, the Chief Justice granted an extension of time for filing this petition to and including January 2, 2002. (App. 83a.) This Court has jurisdiction under 28 U.S.C. § 1254(1).

CONSTITUTIONAL AND STATUTORY PROVISIONS INVOLVED

This petition for a writ of certiorari raises issues regarding Rule 52(a) of the Federal Rules of Civil Procedure, and the Due Process Clause of the Fifth Amendment to the United States Constitution.

Rule 52(a) of the Federal Rules of Civil Procedure states:

> **Rule 52. Findings by the Court; Judgment on Partial Findings**
>
> (a) Effect. In all actions tried upon the facts without a jury or with an advisory jury, the court shall find the facts specially and state separately its conclusions of law thereon, and judgment shall be entered pursuant to Rule 58; and in granting or refusing interlocutory injunctions the court shall similarly set forth the findings of fact and conclusions of law which constitute the grounds of its action. Requests for findings are not necessary for purposes of review. Findings of fact, whether based on oral or documentary evidence, shall not be set aside unless clearly erroneous, and due regard shall be given to the opportunity of the trial court to judge of the credibility of the witnesses. The findings of a master, to the extent that the court adopts them, shall be considered as the findings of the court. It will be sufficient if the findings of fact and conclusions of law are stated orally and recorded in open court following the close of the evidence or appear in an opinion or memorandum of decision filed by the court. Findings of fact and conclusions of law are unnecessary on decisions of motions under Rule 12 or 56 or any other motion except as provided in subdivision (c) of this rule.

The Fifth Amendment to the United States Constitution (with the Due Process Clause italicized) states:

> No person shall be held to answer for a capital, or otherwise infamous crime, unless on a

presentment or indictment of a Grand Jury, except in cases arising in the land or naval forces, or in the Militia, when in actual service in time of War or public danger; nor shall any person be subject for the same offence to be twice put in jeopardy of life or limb; nor shall be compelled in any criminal case to be a witness against himself, *nor be deprived of life, liberty, or property, without due process of law*; nor shall private property be taken for public use, without just compensation.

STATEMENT OF THE CASE

A. Technological Background

Plasma etching, an important technology used in the manufacturing of computer chips, involves the removal of material from the surface of a semiconductor "wafer" in precise patterns. An etched wafer forms the template for an electronic integrated circuit. Some types of plasma etching are "isotropic," which means that the etching takes place at an equal rate in all directions, yielding curved etch patterns. Other types of plasma etching are "anisotropic," which means that the etching takes place primarily in a vertical direction. Anisotropic etching creates more sharply defined etch patterns than are possible with isotropic etchers. The precision of anisotropic etching is crucial as today's integrated circuits become smaller and more complex than previous generations of computer chips. Ion bombardment — a phenomenon in which charged particles shoot down onto the wafer surface — is what brings about anisotropic etching.

When anisotropic etching began to come into wide use in the late 1970s, the most common etcher design was a single frequency diode (two electrode) configuration. These early diode etchers had many drawbacks, one of which was the inability to

control plasma density and ion energy independently. Plasma density in the early diodes could be increased in order to bring about higher etching speed, but increasing plasma density had the disadvantage of increasing ion energy at the same time, which tended to damage the wafer. By the same token, ion energy could be reduced, but that had the effect of reducing plasma density to such a low level that it was no longer useful in etching. Single frequency triode (three electrode) etcher designs allowed independent control of plasma density and ion energy, but suffered from their own drawbacks.

By the early 1980s many researchers in the semiconductor manufacturing industry were looking for ways to achieve independent control over plasma density and ion energy. Tegal Corporation ("Tegal") was the first to solve this fundamental problem in etcher design. Tegal's U.S. Patent No. 4,464,223 ("the '223 patent"), issued to inventor Georges Gorin in August 1984, claims an apparatus and method of plasma processing utilizing a novel combination of three electrodes and two frequencies. One electrode is coupled to a high frequency alternating current ("AC") source, and one electrode is coupled to a low frequency AC source. (Lodging Submitted Concurrently with Petition ("Ldg.") L-1, L-4, col. 1, ll. 50-55.) The '223 patent's specification explains that the three electrodes operate together to create two overlapping electric fields, a high frequency and a low frequency field, thereby permitting simultaneous and independent control of the plasma density and ion energy. (Ldg. L-4, col. 2, ll. 29-32 & 58-63.) This independent control permits the user to maximize etch rate and uniformity at the same time. (Ldg. L-4 – L-5.)

B. Procedural History

In March 1998, Tegal brought a suit in the United States District Court for the Eastern District of Virginia against

respondent Tokyo Electron America, Inc. ("TEA"), charging that two lines of plasma etchers sold by TEA in the United States infringe the '223 patent. The claims arose under 35 U.S.C. § 271 *et seq.* and were subject to federal jurisdiction under 28 U.S.C. §§ 1331 and 1338.

The District Court held a bench trial on May 26-29, 1999. In an extensive set of findings and conclusions filed on August 31, 1999, the District Court found that both of the accused etchers literally infringe claims 1 and 7 of the '223 patent (App. 73a); rejected TEA's invalidity and unenforceability defenses (App. 56a-65a, 73a); found TEA's infringement to be willful (App. 55a-56a, 73a); and found the case to be exceptional under 35 U.S.C. § 285, thus entitling Tegal to an award of attorneys' fees (App. 74a).

TEA appealed to the Federal Circuit, which issued an opinion on July 16, 2001 affirming the District Court's infringement finding and rejection of all of TEA's defenses except invalidity for anticipation under 35 U.S.C. § 102(b). (App. 1a-42a.) The defense of anticipation requires a showing by clear and convincing evidence that a single prior art reference discloses each and every limitation of the allegedly invalid patent claim.[1] Here, the basis of TEA's anticipation defense is a prior

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1. *See, e.g., Brown v. 3M*, 265 F.3d 1349 (Fed. Cir. 2001) (to invalidate a patent claim by anticipation, a prior art reference must disclose each and every limitation of the claim); *Helifix, Ltd. v. Blok-Lok, Ltd.*, 208 F.3d 1339, 1346 (Fed. Cir. 2000) (anticipation must be proved by clear and convincing evidence). Analytically, the determination of anticipation is analogous to the determination of literal infringement, since, in each case, the fact finder must find that each limitation of the asserted claim is present (for anticipation, in the prior art reference that allegedly anticipates, and for infringement, in the accused device). *See Brown*, 265 F.3d at 1352-53 ("That which infringes if later anticipates if earlier.").

art publication known as the "Itakura reference," a 1976 patent application published (but never issued as a patent) in Japan. (Ldg. L-10 – L-25.) The Federal Circuit found the reasons given by the District Court as the basis for concluding that Itakura does not anticipate to be clearly erroneous (App. 29a), but identified additional issues remaining to be considered before any final conclusion on the defense of anticipation may be drawn (App. 34a). Thus, the Federal Circuit vacated and remanded for further consideration. (App. 34a, 42a.) Because this result rendered premature any consideration of remedy, the Federal Circuit also vacated the injunction, the findings of willfulness and exceptional case, and the award of attorneys' fees. (App. 42a.)

This petition for certiorari focuses on the Federal Circuit's construction of the term "plasma" in the first instance on appeal. The District Court did not address the term "plasma" as a matter of claim construction. At the December 1998 pretrial hearing conducted by the District Court for the purpose of construing disputed claim terms — known as a *Markman* hearing — there was no dispute over the meaning of plasma because, early in discovery, TEA admitted the existence of plasma in the accused devices. (Record at A3606.) Neither party even argued that the term "plasma" is a material element of the asserted claims. [2]

At trial, however, TEA began to change its position; as the predicate to a non-infringement argument that the plasma in the accused etchers does not electrically connect to the etcher wall and thus that the wall cannot be an "electrode," TEA's expert opined that "plasma" has a very narrow meaning. (Record at A14441-42 (Trial Testimony of Dr. Herbert Sawin).) But TEA

2. The terms "plasma" and "glow discharge" (another term which is used interchangeably with "plasma") appear in the preamble of the claim language, not in the body of the claims themselves.

did not actually present an argument regarding the meaning of plasma until after trial. In proposed findings and conclusions following trial, TEA argued for the first time that the District Court should adopt the narrow meaning of "plasma" advanced at trial by its expert as a matter of claim construction. This request for a claim construction ruling came almost six months after the *Markman* hearing, at a time when the evidence was closed and Tegal had no meaningful opportunity to respond.

The District Court declined to address this belated request for a claim construction ruling and, instead, in its background findings of fact, described the nature and characteristics of plasma in detail. (App. 47a-48a.) On appeal, the Federal Circuit decided that the term "plasma" is a material claim element that should have been construed (App. 23a-28a), and, having identified the issue, proceeded to address it. Tegal argued that the issue had been waived, but the Federal Circuit justified its decision to address the meaning of "plasma" as a matter of claim construction for the first time on appeal on the ground that the District Court's findings of fact amounted, in effect, to a "working definition." (App. 23a).

It is undisputed that "plasma" is a technical term of art and is not specifically defined anywhere in the '223 patent or the prosecution history.[3] The District Court, in its "working

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3. The Federal Circuit has emphasized that construction of unambiguous claim language is to be based primarily on the "intrinsic" evidence (the language of the patent claim, the written description in the patent, and the patent's file history). *See Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582-83 (Fed. Cir. 1996). But it has also held that "extrinsic" evidence (e.g. scientific treatises and articles, testimony from expert witnesses) not only may be considered but should be considered where technical terms of art are involved, since in that situation the claim language must be viewed through the prism of a

(Cont'd)

definition," found that the term has a specific meaning in the context of the '223 patent. (App. 47a-48a.) According to the District Court's findings of fact, a plasma is a charged collection of particles created by applying an electric field to a gas; a plasma includes a region known as the "sheath" at its outer perimeter; and etching takes place within the plasma through ion bombardment, a phenomenon in which ions accelerate across the "sheath" onto the wafer surface. (*Id.*)

The Federal Circuit acknowledged that "plasma" is a technical term of art, but construed the term by looking no further than the '223 claim language, the specification and the prosecution history. (App. 24a-28a.) According to the Federal Circuit, " 'plasma' need only contain ions and be generated by electric fields." (App. 25a.) Unmentioned in this definition is any requirement of ion bombardment through the plasma "sheath" at the wafer surface, a critical omission because not all plasmas used in plasma etching make use of ion bombardment. Because ion bombardment at the wafer surface can cause damage to the extremely fine and delicate interconnections in integrated circuits, some etching techniques are designed to work through purely chemical means. (Record at A47101.002-A47101.003, A47101.009.) In one Japanese design known as a "downstream etcher," for example, a major objective is to keep the plasma away from the wafer and allow the etching to take place at a location separate from where the plasma is generated; the chemical residue of the plasma is then filtered

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(Cont'd)
person skilled in the relevant art. *See, e.g., Generation II Orthotics Inc. v. Medical Tech. Inc.*, 263 F.3d 1356, 1366-67 (Fed. Cir. 2001); *AFG Indus., Inc. v. Cardinal IG Co.*, 239 F.3d 1239, 1249 (Fed. Cir. 2001); *Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1309 (Fed. Cir. 1999).

down to the wafer surface, where the etching takes place through chemical reactivity, with little or no ion bombardment at the wafer. (Record at A2041.326; *see also* Record at A2068.067-A2068.069, A2068.346.)[4]

The District Court fully appreciated these technical nuances, having sat through a *Markman* hearing and a trial at which it took extensive evidence on the nature of plasma and the different types of plasma etchers. By contrast, the Federal Circuit developed its construction of plasma *sua sponte* on appeal, without subjecting it to the adversarial process or grounding it in the technical background evidence considered by the District Court. Tegal had no notice that the Federal Circuit was considering the construction it adopted and no opportunity to present briefing or argument on it. Unless Tegal had designated the entirety of the record evidence for reproduction in the joint appendix (which is contrary to the Federal Circuit's Rules), there was no way to ensure that the appendix contained every aspect of the record that might be pertinent to all unknown claim constructions that might be adopted *sua sponte* by the Federal Circuit. Taken by surprise when the Federal Circuit's opinion issued, Tegal did the best it could given the inherent constraints

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4. The Itakura reference discloses a downstream etching mechanism, as shown by the inventor's statement that he wishes to keep the plasma in his etching chamber away from the wafer. (Ldg. L-20 – L-21.) Above the grid bisecting Itakura's chamber he shows a group of dots labeled "plasma," while below the grid — and filtered through it — he shows something else, little arrows depicting what he calls a "reaction component." (Ldg. L-20 – L-21, L-24.) There was conflicting expert testimony at trial as to whether one can infer from what is disclosed below Itakura's grid whether there is ion bombardment there (*i.e.*, whether Itakura's "reaction component" is the type of plasma used in the '223 patent). *Compare* Record at A14291-92 (Trial Testimony of Dr. Brian N. Chapman) *with* Record at A14587-88 (Trial Testimony of Dr. Herbert Sawin).

of the appellate process. It submitted a petition for rehearing; and through a concurrently filed motion to supplement the joint appendix, sought to apprise the Federal Circuit of evidence in the record highlighting the errors in its plasma construction. On August 20, 2001, the Federal Circuit denied without comment Tegal's motion to supplement. (App. 82a.) On September 4, 2001, the Federal Circuit denied the rehearing petition. (App. 76a-77a.) This petition followed.

REASONS FOR GRANTING THE WRIT

In *Markman v. Westview Instruments, Inc.*, 517 U.S. 370, 372 (1996) ("*Markman II*"), this Court held that the construction of patent claims is exclusively within the province of judges and admits of no role for juries. But that decision involved the allocation of decision-making authority as between judge and jury under the Seventh Amendment. This case, by contrast, involves the review of a federal District Court decision following a bench trial and the allocation of decision-making authority as between the District Courts and the Federal Circuit.

By this petition, Tegal presents two issues that merit this Court's attention under Supreme Court Rules 10(a) and 10(c). First, the Court should grant certiorari to decide whether subsidiary findings of fact foundational to the ultimate legal determination of patent claim meaning are entitled to deference under Rule 52(a) of the Federal Rules of Civil Procedure. In *Markman II*, this Court described claim construction as a "mongrel practice" that falls somewhere between a pure legal ruling and a finding of historical fact. 517 U.S. at 378. In *Cybor Corp. v. FAS Technologies, Inc.*, 138 F.3d 1448, 1456 (Fed. Cir. 1998) (*en banc*), a sharply divided Federal Circuit interpreted *Markman II* to allow *de novo* decision of all claim construction issues on appeal, including subsidiary issues of fact. Courts throughout this country, state and federal, follow a two-tiered

approach to appellate review of "mixed questions" under which the ultimate legal question is reviewed *de novo*, while subsidiary questions of fact are reviewed for clear error. The rule in *Cybor* conflicts with this universally followed two-tiered standard. This Court has reversed the Federal Circuit before for failing to adhere to the dictates of Rule 52(a), *Dennison Mfg. Co. v. Panduit Corp.*, 475 U.S. 809 (1987), and it should do so again here.

Second, the Court should grant certiorari to decide whether the Federal Circuit abused its discretion under *Singleton v. Wulff*, 428 U.S. 106 (1976), by construing the meaning of the patent claim term "plasma" on appeal when that issue had not been addressed by the District Court. Under the standard laid down by this Court in *Singleton*, a federal appellate court has broad discretion to determine when to address issues in the first instance on appeal. That discretion, however, is not unbounded, and indeed this Court held that the Eighth Circuit abused its discretion in *Singleton*. On this record, the proper construction of the claim term "plasma" was not so plain as a matter of law as to admit of no doubt on appeal or no need for further evidentiary development. Whatever the outer bounds of appellate discretion to address issues in the first instance on appeal, that discretion is necessarily bounded by the strictures of due process. The Federal Circuit crossed this outer boundary here.

I. Certiorari Should Be Granted to Address the *De Novo* Scope of Review Announced in *Cybor*.

A. The Scope of Review Issue Is an Important and Recurring Issue in Patent Cases and Has Long Been the Subject of Vigorous Disagreement Within the Federal Circuit.

In *Markman II*, the Court held that "the construction of a patent, including terms of art within the claim, is exclusively within the province of the court." 517 U.S. at 372. The Court expressly declined to base its holding — that claim construction "is an issue for the judge, not the jury," *id.* at 391 — on the rationale, relied on by the Federal Circuit, that claim construction does not require findings of fact. *Id.* at 384 n.10 ("we need not decide either the extent to which the Seventh Amendment can be said to have crystallized a law/fact distinction, [citations], or whether post-1791 precedent classifying an issue as one of fact would trigger the protections of the Seventh Amendment if (unlike in this case) there were no more specific reason for the decision.").

Although the Court did not decide whether claim construction sometimes involves subsidiary questions of fact — perhaps because it recognized that that issue was not squarely presented by the case — it several times intimated that claim construction *must* sometimes include subsidiary fact questions. For example, the Court described claim construction as a "mongrel practice" that can involve "construing a term of art following the receipt of evidence." *Id.* at 378. The Court further suggested that claim construction "falls somewhere between a pristine legal standard and a simple historical fact." *Id.* at 388 (quoting *Miller v. Fenton*, 474 U.S. 104, 114 (1985)).[5]

5. In the same year in which *Markman II* was decided, Justice (Cont'd)

For many years, this unresolved issue was the subject of a sharp split in Federal Circuit case law. There were two substantial lines of authority — one that held that claim construction may require resolution of underlying factual disputes, *see Markman v. Westview Instrs., Inc.*, 52 F.3d 967, 976-77 (Fed. Cir. 1995) (*en banc*) ("*Markman I*") (citing cases), and a second line of authority that held that claim construction is strictly a matter of law reviewed without deference, *id.* at 976, 977 (citing cases). The Federal Circuit sought to resolve the split in *Markman I*, adopting the line of precedent that viewed claim construction as strictly a matter of law reviewed *de novo* on appeal. *Id.* at 979.[6] Uncertainty resurfaced following this Court's decision in *Markman II*, which affirmed *Markman I* but did not address the applicable standard of review. In an effort to put the question to rest, the Federal Circuit, sitting *en banc* in *Cybor*, once again ruled that claim construction rulings are subject to *de novo* review on appeal in all respects, whether or not they are grounded on subsidiary findings of fact. 138 F.3d at 1456.

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Stevens expressly classified *Markman II* as a case involving "mixed questions of law and fact." *Gasperini v. Center for Humanities*, 518 U.S. 415, 443 (1996) (Stevens, J., dissenting). Justice Stevens noted that, where such mixed questions are at issue, appellate courts must "construe all record inferences in favor of the factfinder's decision and then . . . determine whether, *on the facts as found below*, the legal standard has been met." *Id.* (emphasis added, citations omitted).

6. Judge (now Chief Judge) Mayer, though concurring in the judgment, stated that the Federal Circuit's "revisionist reading of precedent to loose claim interpretation from its factual foundations will have profoundly negative consequences." *Id.* at 990 (Mayer, J., concurring in judgment); *see also id.* at 998 (Rader, J., concurring in judgment); *id.* at 999, 1008-10 (Newman, J., dissenting).

Three judges in *Cybor* concurred in the judgment while stating sharp disagreement with the majority's decision to adopt a pure *de novo* review standard. Chief Judge Mayer pointed out that that standard takes the Federal Circuit beyond the traditional role of a court of review, *id.* at 1463-64, and "deprives the parties of important substantive and procedural mechanisms provided in the trial courts," *id.* at 1464; Judge Rader pointed out that *Cybor* destroys the promise of increased uniformity offered by *Markman II* and has the perverse effect of creating more instability, not less, because "a *de novo* review of claim interpretations . . . postpone[s] the point of certainty to the end of the litigation process, at which point, of course, the outcome is certain anyway," *id.* at 1476[7]; and Judge Newman pointed out that the "unpredictability in administration of the law of patent claiming [created by *de novo* review] . . . add[s] a sporting element to our bench," *id.* at 1479, by increasing incentives for appeals and devaluing what occurred in the District Court.

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7. As Judge Rader has noted, the Federal Circuit's penchant for appellate fact-finding is not limited to factual issues framed by the parties. Instead, as we see in this case, the Federal Circuit often "reject[s] not only the trial court's claim reading, but also the readings of both parties at trial and the readings advocated by all experts at trial." *See Cybor*, 138 F.3d at 1476 (Rader, J., concurring in judgment) (discussing *Exxon Chemical Patents, Inc. v. Lubrizol Corp.*, 64 F.3d 1553 (Fed. Cir. 1995), and *J.T. Eaton & Co. v. Atlantic Paste & Glue Co.*, 106 F.3d 1563 (Fed. Cir. 1997)). In what may represent the most startling example of the Federal Circuit's lack of restraint, the court *affirmed* a District Court's claim construction of a patent in an unpublished opinion, *see CVI/Beta Ventures, Inc. v. Custom Optical Frames, Inc.*, 1996 WL 338388 (Fed. Cir. 1996) (unpublished) ("*CVI I*"), yet *reversed* the identical claim construction of the *exact same* patent in a second case, *see CVI/Beta Ventures, Inc. v. Tura LP*, 112 F.3d 1146, 1149 (Fed. Cir. 1997) ("*CVI II*"); *see also Cybor*, 138 F.3d at 1476-77 (Rader, J., concurring in judgment) (discussing *CVI I* and *CVI II*, and questioning, "Is this the 'uniformity' outlined by the Supreme Court in *Markman II*?").

Both the majority and the minority in *Cybor* found support for their views in *Markman II*. *See id.* at 1455-56 (majority opinion); *id.* at 1463-64 (Mayer, C.J., concurring in judgment); *id.* at 1473, 1478 (Rader, J., concurring in judgment).

The *Cybor* decision may have settled the issue within the Federal Circuit, but today, more than three years later, *Cybor* remains the subject of sharp criticism, from the trial bench,[8] veteran practitioners in the field of patent litigation,[9] and legal academe.[10] Given the centrality of claim construction to patent litigation following *Markman I*, reversal of the Federal Circuit's *Cybor* decision would promote certainty and finality in patent litigation,[11] and discourage the steadily increasing volume of appeals to the Federal Circuit. This Court has reversed the Federal Circuit before for failing to give due regard to District Court findings on review of mixed questions of fact and law.

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8. *See, e.g.*, *Control Resources, Inc. v. Delta Elecs., Inc.*, 133 F. Supp. 2d 121, 123 (D. Mass. 2001).

9. *See, e.g.*, William C. Rooklidge & Matthew F. Weil, "Judicial Hyperactivity: The Federal Circuit's Discomfort with Its Appellate Role," 15 Berkeley Tech. L.J. 725 (2000); Donald R. Dunner & Howard A. Kwon, "Cybor Corp v. FAS Technologies: The Final Say on Appellate Review of Claim Construction?," 80 J. Pat. & Trademark Off. Soc'y 481 (1998) (calling for a grant of certiorari).

10. *See, e.g.*, John Duffy, "Patent Law and Policy Symposium: Re-Engineering Patent Law: The Challenge of New Technologies: Part I: Administrative Law Issues: On Improving the Legal Process of Claim Interpretation: Administrative Alternatives," 2 Wash. U. J.L. & Pol'y 109, 115-20 (2000).

11. The uncertainty in patent litigation created by the high rate of reversals on claim construction issues is notorious. *See* Ted D. Lee & Michelle Evans, "The Charade: Trying a Patent Case to All 'Three' Juries," 8 Tex. Intell. Prop. L.J. 1, 14 (1999).

See Dennison Mfg. Co. v. Panduit Corp,. 475 U.S. 809 (1987) (Federal Circuit must adhere to Rule 52(a) when reviewing subsidiary findings of fact in obviousness determination). The Court should take this occasion once again to ensure that the Federal Circuit gives proper deference to District Court findings of fact when reviewing mixed questions.

B. The Power of Review that the Federal Circuit Granted to Itself in *Cybor* Conflicts with Well-Established Law Governing Appellate Standards of Review in Federal and State Courts.

In *Markman II*, this Court emphasized the Federal Circuit's special responsibility to maintain the national uniformity of patent law doctrine. There is only one other area of federal law in which appellate courts undertake *de novo* review of facts on appeal. Where facts are so intertwined with certain questions of constitutional law, this Court has on occasion found that plenary review on appeal is warranted. *See New York Times Co. v. Sullivan*, 376 U.S. 254, 285 (1964); *Ornelas v. United States*, 517 U.S. 690, 697 (1996); *Miller v. Fenton*, 474 U.S. 104, 114 (1985); *Bose Corp. v. Consumers Union of United States, Inc.*, 466 U.S. 485, 502 (1984). Even in that special setting, however, there is broad consensus among the circuits that a two-tiered scope of review applies, with the ultimate legal conclusion subject to *de novo* review while subsidiary findings of historical fact are reviewed with deference under Rule 52(a).[12]

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12. *See, e.g.*, *United States v. Laine*, 270 F.3d 71, 74 (1st Cir. 2001); *United States v. Harrell*, 268 F.3d 141, 145 (2d Cir. 2001); *United States v. Harple*, 202 F.3d 194, 196 (3d Cir. 1999); *United States v. Rusher*, 966 F.2d 868, 873 (4th Cir. 1992); *United States v. Jacquinot*, 258 F.3d 423, 427 (5th Cir. 2001); *United States v. Hill*, 142 F.3d 305, 310 (6th Cir. 1998); *United States v. Brown*, 232 F.3d 589, 591-92 (7th Cir. 2000); (Cont'd)

This Court also pointed out in *Markman II* that claim interpretation decisions ought to be made by judges, not juries, because of the special training judges have in construing documents. 517 U.S. at 388-89. Contract interpretation is the classic scenario in which common law judges call upon their special training in document construction. With impressive unanimity — all forty-nine states to address the question specifically — state appellate courts review the interpretation of contract documents in the same two-tiered manner that the federal circuit courts do in "constitutional fact" cases. Contract interpretation is a matter of law reviewable *de novo* on appeal where the language at issue is plain and unambiguous, but where the trial court has gone beyond the four corners of the contract to ascertain drafting intent, findings of fact based on extrinsic evidence are reviewed for clear error.[13]

Unquestionably, given this well-settled body of law, *Cybor* is an aberration. It may be that the Federal Circuit has a singular duty to declare the law in patent cases, but every federal appellate court — especially this one — has a special responsibility for law declaration in "constitutional fact" cases, and yet in that setting subsidiary findings of historical fact are always reviewed with deference. It may also be that the Federal Circuit is just as

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United States v. Reinholz, 245 F.3d 765, 773 (8th Cir. 2001); *United States v. Chavez-Valenzuela*, 268 F.3d 719, 723 (9th Cir. 2001); *United States v. Gutierrez-Daniez*, 131 F.3d 939, 940-41 (10th Cir. 1997); *United States v. Jiminez*, 224 F.3d 1243, 1247 (11th Cir. 2001); *United States v. Kayode*, 254 F.3d 204, 209 (D.C. Cir. 2001).

13. *See* cases cited at App. 85a-88a. (These citations are included in an appendix due to their length; were they included in the body of the petition, this would add four pages to the length of the body text. Tegal has therefore ensured that the body text of this petition does not exceed 26 pages.)

well positioned as the District Courts to decide issues of claim construction because both trial and appellate judges have equal access to the textual materials that drive that analysis; but the same may be said of all common law appellate courts in garden-variety contract cases, and yet there findings of fact based on extrinsic evidence are always reviewed under a deferential standard. There is nothing about patent claim construction that justifies the Federal Circuit's departure from this traditional approach to appellate review.

In the end, the *Cybor* doctrine rests on nothing more than the fiction that District Courts merely take extrinsic evidence into account in some sort of provisional way when construing patent claim language and do not actually find facts. *See* 138 F.3d at 1454 (quoting *Markman I*, 52 F.3d at 981). The unvarnished comments of one experienced District Judge cut to the heart of the problem with this rationale:

> When two expert witnesses testify differently as to the meaning of a technical term, the court embraces the view of one, the other, or neither while construing a patent claim as a manner of law, the court *has* engaged in weighing evidence and making credibility determinations. If those possessed of a higher commission wish to rely on a cold written record and engage in *de novo* review of all claim constructions, that is their privilege. But when the Federal Circuit Court of Appeals states that the trial court does not do something that the trial judge does and must do to perform the judicial function, that court knowingly enters a land of sophistry and fiction.

Lucas Aerospace, Ltd. v. Unison Industries, L.P., 890 F. Supp. 329, 333 n.7 (D. Del. 1995) (Schwartz, J.); *see Cybor*, 138 F.3d

at 1475 (Rader, J., concurring in judgment) (quoting *Lucas Aerospace*).

This case starkly confirms Judge Schwartz's observations in *Lucas Aerospace*. The disputed claim term here — "plasma" — is a technical term of art, and under the Federal Circuit's own cases, technical terms must be construed through the eyes of skilled artisans.[14] How a skilled artisan would view the meaning of plasma in a particular context is a question of historical fact. The application of the patent claim language to the facts, as found, is ultimately a question of law; but there can be no denying that questions of historical fact are subsidiary to that ultimate inquiry.[15] Clearly, the District Court recognized this, because it assessed the meaning of plasma purely in factual terms and entered a detailed set of findings defining it. (App. 47a-48a.)[16] Indeed, these findings, termed a "working definition"

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14. *See supra* note 3.

15. *See* Christian A. Chu, "Empirical Analysis of the Federal Circuit's Claim Construction Trends," in *How to Prepare & Conduct Markman Hearings*, Practising Law Institute, Patents, Copyrights, Trademarks, and Literary Property Course Handbook Series PLI Order No. G0-00TZ (July 2001) ("That claims must be construed by the court does not divorce the interpretive process from a host of inherently factual subsidiary matters, such as how one skilled in the art would understand claim terms and prosecution history statements.").

16. TEA has never claimed, nor did the Federal Circuit suggest, that the background facts found by the District Court are erroneous or in any way contradict the patent claim language or the written description of the invention in the patent. For the Federal Circuit to have adopted its own construction of "plasma" *de novo* without regard to these findings contravenes Rule 52(a) of the Federal Rules of Civil Procedure. *See Anderson v. City of Bessemer City*, 470 U.S. 564, 574 (1985) (Rule

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by the Federal Circuit, provided the justification for addressing the issue in the first instance on appeal as a matter of claim construction, even though the District Court had not addressed the issue on that basis. (App. 23a-24a.) Rather than draw upon the technical context provided by the District Court's findings, however, the Federal Circuit cast them aside in favor of its own independent view, as if every Federal Circuit judge qualifies *per se* as a person skilled in every relevant art.[17]

If this radical approach to the scope of review of claim construction rulings in patent cases is proper, it raises serious procedural questions that the Federal Circuit has not yet shown an inclination to address, after several years of experience with

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52(a) applies "even when the district court's findings do not rest on credibility determinations, but are based instead on physical documentary evidence or inferences from other facts").

17. The Federal Circuit's refusal to consider the full technical context in its construction of "plasma" also infected its anticipation analysis. The District Court found that unlike the '223 patent invention, the Itakura reference discloses two separate plasmas separated by a grid. (App. 62a-63a.) The Federal Circuit, having defined "plasma" so broadly as to omit the requirement of ion bombardment through a plasma sheath at the wafer surface, reversed on this point. It found that there is necessarily a single plasma present throughout Itakura's chamber because the holes in Itakura's interior grid are large enough to allow "smooth passage of the reaction component" through it (App. 32a-33a) (which begs the question whether the "reaction component" is chemical in nature); and "logically," the Federal Circuit found, ions must make their way through the grid, for if they did not, there could be no etching at the wafer (App. 33a). The factual premise of this "logic" is simply incorrect, because in some types of plasma processing the etching takes place through chemical reactivity only, without ion bombardment at the wafer. (*See* Record at A47101.002-A47101.003.)

the *Cybor* doctrine. Two examples will suffice. First, the Federal Circuit has declined to undertake regular review of *Markman* rulings by interlocutory appeal, an approach that could ameliorate the needless waste of resources entailed by a system in which the trial process has no real finality.[18] Second, the Federal Circuit has never once mentioned or attempted to grapple with the question of how broadly it must review the record when it undertakes *de novo* review. This Court has stated in the "constitutional fact" setting that *de novo* review requires full examination of the entire record. *Harte-Hanks Communications, Inc. v. Connaughton*, 491 U.S. 657, 688 (1989). The conventional joint appendix procedure used by the Federal Circuit does not permit this; reliance on selected excerpts is bound to leave gaps where, as here, the Federal Circuit chooses to forge its own path without regard to the issues framed by the parties. Examination of the entire record may be a heavy burden, but it is a burden that is fully appropriate to an extraordinary power of review that requires an appellate court, in effect, to seek to put itself in the position of the trial court. *De novo* review of facts should be undertaken rarely, Tegal submits, because it is simply not possible to undertake it routinely and in volume, as the Federal Circuit has done under *Cybor*.

These two procedural questions serve to illustrate just how ill-suited the appellate process is to consideration of facts on a *de novo* basis. But they also demonstrate the wisdom and

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18. *See* Craig Allen Nard, "Symposium: Intellectual Property Challenges in the Next Century: Process Considerations in the Age of Markman and Mantras," 2001 U. Ill. L. Rev. 355, 372 n.4 & accompanying text (noting Federal Circuit's refusal to accept interlocutory appeals of claim construction orders); *Cybor*, 138 F.3d at 1479 (Newman, J., additional views) (same).

importance of giving proper deference to the District Courts under Rule 52(a) of the Federal Rules of Civil Procedure.[19]

II. Certiorari Should Be Granted Because the Federal Circuit's Practice of Deciding Claim Construction Issues Not Addressed by the Trial Court Conflicts with this Court's Decision in *Singleton* and, in this Case, Denied Tegal the Right to Procedural Due Process.

In *Singleton*, this Court reversed a decision by the Court of Appeals for the Eighth Circuit that reached the merits of a constitutional challenge to a state statute. The Court of Appeals had reversed the trial court's dismissal of the complaint for lack of standing. 428 U.S. at 110-11. The Court of Appeals went on to address the merits of the plaintiffs' complaint, and held that the statute at issue was unconstitutional. *Id.* at 111-12. Because the defendant was not given an opportunity to present evidence or legal argument to the trial court on the merits, this Court held that "the Court of Appeals' resolution of the merits seems

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19. The observations of Charles Alan Wright in his influential and aptly titled article, "The Doubtful Omniscience of Appellate Courts," 41 Minn. L. Rev. 751 (1957), remain as pertinent today as they were more than forty years ago. *See id.* at 779 ("The principal consequences of broadening appellate review are two. Such a course impairs the confidence of litigants and the public in the decisions of the trial courts, and it multiplies the number of appeals." (footnote omitted)). Wright criticized a line of cases originating with *Orvis v. Higgins*, 180 F.2d 537, 539-40 (2d Cir.), *cert. denied*, 340 U.S. 810 (1950), which held that Rule 52(a) does not apply where the District Court's findings of fact are based purely on documentary evidence. *Orvis* and its progeny were effectively overruled when Rule 52(a) was amended in 1985. *See Zervos v. Verizon New York Inc.*, 252 F.3d 163, 169-72 (2d Cir. 2001). The Federal Circuit's *Cybor* rule represents even more of an evisceration of Rule 52(a) than *Orvis* did, since it effectively suspends Rule 52(a) even where the District Court has made findings based on oral testimony.

to us to be an unacceptable exercise of its appellate jurisdiction." *Id.* at 119-20.

The Court began with the well-accepted premise that "[i]t is the general rule, of course, that a federal appellate court does not consider an issue not passed upon below." *Id.* at 120. This rule assures that the litigants are not deprived of an opportunity to present all of the evidence that they believe is relevant to the issue. *Id.* (citing *Hormel v. Helvering*, 312 U.S. 552, 556 (1941)).

> Moreover, even assuming that there is no such evidence, petitioner should have the opportunity to present whatever legal arguments he may have in defense of the statute. We think he was justified in not presenting those arguments to the Court of Appeals, and in assuming, rather, that he would at least be allowed to answer the complaint, should the Court of Appeals reinstate it.

Singleton, 428 U.S. at 120.

In short, notwithstanding that "[t]he matter of what questions may be taken up and resolved for the first time on appeal is one left primarily to the discretion of the courts of appeals, to be exercised on the facts of individual cases," *id.*, that discretion is not unbounded. Where no precedent clearly controls, "injustice [is] more likely to be caused than avoided by deciding [an] issue without petitioner's having had an opportunity to be heard." *Id.*

Just as the defendant in *Singleton* was entitled to assume that, if the dismissal for lack of standing were reversed, he would at least be allowed to answer the complaint and present his arguments on the merits to the trial court in the first instance, so too are patent litigants entitled to assume that the Federal Circuit will not issue claim construction rulings based on

arguments never made by any party or passed on by the court below. That, however, is precisely what the Federal Circuit did in this case, and precisely what the Federal Circuit has done in other cases, including *Exxon Chemical Patents* and *J.T. Eaton & Co.*

The Federal Circuit's habit of issuing novel claim constructions, based on arguments not made by the parties and not considered by the court below, effectively denies parties a meaningful opportunity to be heard. *Cybor*, 138 F.3d at 1466 (Mayer, C.J., concurring in judgment) ("Such indiscriminate and conclusive review deprives the parties of important substantive and procedural mechanisms provided in the trial courts, where interpretation can be informed by additional discovery and expert testimony, and where it can be checked by appellate review as a matter of right."); *see Mathews v. Eldridge*, 424 U.S. 319, 333 (1976) (due process requires an opportunity to be heard at a meaningful time and in a meaningful manner). Moreover, the Federal Circuit's practice cannot be justified on the ground that it is announcing new, generally applicable legal principles. To the contrary, the Federal Circuit's claim construction rulings are relevant to, at most, the patent holder and those who may be practicing the claimed invention. *Cybor*, 138 F.3d at 1466 (Mayer, C.J., concurring in judgment) ("even if this court identifies a question of claim construction as one of law — though its resolution is relevant only to the particular litigation or document — it cannot elevate the activity to one of determining legal principles").

Because the Federal Circuit reviews *de novo* the meaning of patent claims terms — including subsidiary issues of fact — appellate restraint under *Singleton* is particularly important in the claim construction setting. Otherwise, litigants may be faced with wholly unexpected claim constructions, under circumstances where there is no meaningful opportunity to

apprise the court of all pertinent portions of the record and effectively no right of review. In this case, the first and only opportunity Tegal had to address the Federal Circuit's construction of "plasma" was on a petition for rehearing, combined with a request to supplement the joint appendix. The Federal Circuit declined to consider Tegal's proposed supplement to the joint appendix. This supplement was designed to bring to the Federal Circuit's attention record evidence showing error in its newly announced construction of "plasma" (principally, evidence explaining downstream etchers and showing that some plasma etching takes place without ion bombardment at the wafer surface). The Federal Circuit's refusal to consider the supplement deprived Tegal of a meaningful opportunity to be heard, because the evidence in the original joint appendix was based on the issues framed in the parties' merits briefs, and neither side urged or suggested the construction of "plasma" adopted by the Federal Circuit. *See* U.S. Const. amend. V (Due Process Clause).

Whatever the outer bounds may be of a Court of Appeals' discretion under *Singleton* to address new issues on appeal, the Federal Circuit's approach to issues of claim construction lies well beyond those bounds. This Court should grant certiorari in order to make clear that the Federal Circuit's regular practice of *sua sponte* addressing claim construction arguments not raised by the parties or addressed by the court below is contrary to this Court's holding in *Singleton*.

CONCLUSION

Although the issues raised by this petition are distinct and may be reviewed separately, they are closely related. One is the flip-side of the other. If, on the one hand (as the Federal Circuit held), the District Court's background findings of fact concerning the nature of plasma were sufficient to justify taking

up the issue of the meaning of the term as a matter of claim construction in the first instance on appeal, then those findings deserved deference under Rule 52(a). If, on the other hand (as Tegal argued), the District Court's decision not construe the term "plasma" in response to a belated request from TEA for a post-trial claim construction ruling (a request made more than six months after the *Markman* hearing, at a time when the evidence was closed and Tegal had no opportunity to respond) amounted to a waiver of the issue, there was nothing to review on appeal. At most, once the panel identified the plasma issue as material, proper appellate practice dictated a remand, *see Icicle Seafoods v. Worthington*, 475 U.S. 509, 714 (1986), because "plasma" is a term of art susceptible of different meanings.

Both of these issues — failure to give subsidiary findings of fact due deference, and appellate decision of questions not passed upon below — are fundamental to the Federal Circuit's institutional role as a court of review. They also have broad national significance, given the nationwide scope of the Federal Circuit's jurisdiction and the elemental nature of claim construction in patent cases. Accordingly, the petition should be granted.

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